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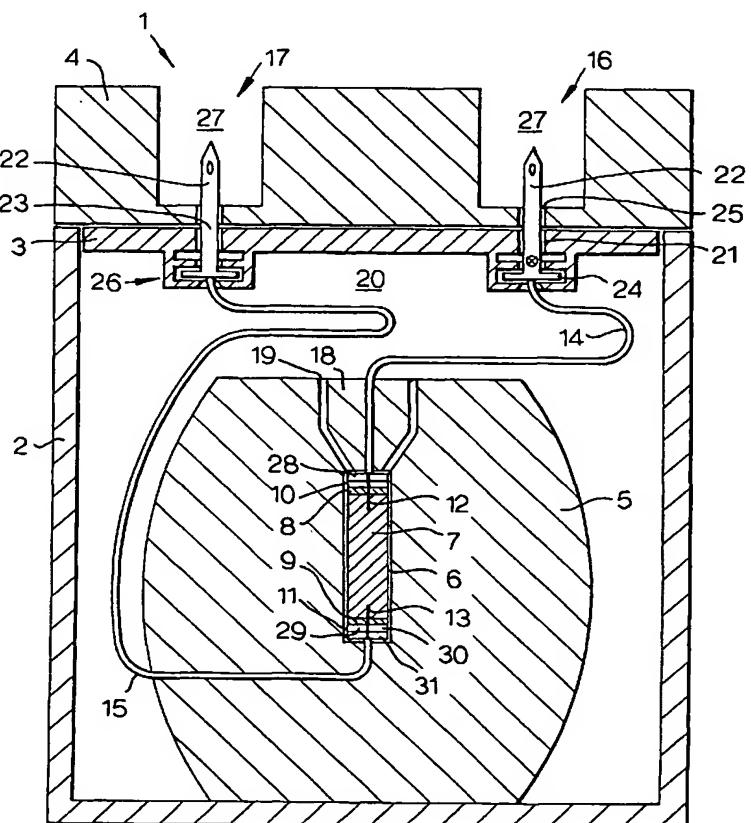
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(54) Title: RADIOISOTOPE GENERATOR AND METHOD OF CONSTRUCTION THEREOF



(57) Abstract: A device for producing a fluid containing a radioactive constituent, comprising a shielded chamber (5) with an opening for receiving an isotope container (6) housing a radioactive isotope (7); a chamber closure (18) adapted for cooperating with and closing the chamber opening; a first fluid port comprising a first hollow needle projecting into the shielded chamber from the chamber closure for fluid communication with the isotope container; a second fluid port comprising a second hollow needle projecting into the shielded chamber from the closed end of the chamber opposite the chamber closure for fluid communication with the isotope container; first and second compressible buffers (28, 29) mounted so as to surround at least partially the respective first and second hollow needles (12, 13), each buffer providing an outer surface for contact with opposed ends of the isotope container; and a spacer of a predetermined thickness associated with one or each of the first and second compressible buffers for determining the positioning of the isotope container within the shielded chamber.



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B. FIELDS SEARCHED

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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WPI Data, PAJ, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|----------|---|-----------------------|
| A | FR 2 041 587 A (COMMISSARIAT À L'ÉNERGIE ATOMIQUE) 29 January 1971 (1971-01-29) the whole document | 1,2,6-9, 14 |
| A | US 3 655 981 A (MONTGOMERY JAMES R ET AL) 11 April 1972 (1972-04-11) column 2, line 48 -column 6, line 61; figures 1-6 | 1,6-9, 14-17 |
| A | FR 2 194 021 A (HOECHST AG) 22 February 1974 (1974-02-22) page 3, line 36 -page 6, line 1; figure 2 | 1,2,6,8, 9,11-14 |
| A | US 3 535 085 A (SHUMATE DONALD J) 20 October 1970 (1970-10-20) the whole document | 1,2,6,8, 14 |
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|----------|--|-----------------------|
| A | US 3 564 256 A (NONHEBEL DIRK ET AL) 16 February 1971 (1971-02-16) cited in the application the whole document ----- | 1,2,6,8, 14 |

INTERNATIONAL SEARCH REPORT

| | |
|----------|----------------|
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|--|---|------------------|--|---|--|--|
| FR 2041587 | A | 29-01-1971 | FR | 2041587 A5 | | 29-01-1971 |
| US 3655981 | A | 11-04-1972 | DE GB JP JP NL | 1959586 A1 1283754 A 52009279 B 49028879 B 6917881 A | | 03-02-1972 02-08-1972 15-03-1977 30-07-1974 02-06-1970 |
| FR 2194021 | A | 22-02-1974 | DE AT AT AU AU BE CH DD ES ES FR GB IL IT JP NL SU US ZA | 2236565 A1 335578 B 650473 A 469264 B2 5840673 A 802839 A1 559959 A5 105392 A5 417087 A1 417088 A1 2194021 A1 1428669 A 42812 A 992668 B 49057298 A 7310153 A 479307 A3 3898044 A 7304837 A | | 07-02-1974 25-03-1977 15-07-1976 05-02-1976 23-01-1975 28-01-1974 14-03-1975 20-04-1974 16-03-1976 16-03-1976 22-02-1974 17-03-1976 31-03-1976 30-09-1975 04-06-1974 29-01-1974 30-07-1975 05-08-1975 26-06-1974 |
| US 3535085 | A | 20-10-1970 | DE JP | 1769289 A1 49028319 B | | 02-03-1972 25-07-1974 |
| US 3564256 | A | 16-02-1971 | NL BE DE DK FI FR GB NO SE | 6607699 A 699446 A 1566539 A1 117913 B 47266 B 1583657 A 1186587 A 123969 B 344278 B | | 04-12-1967 04-12-1967 30-04-1970 15-06-1970 31-07-1973 28-11-1969 02-04-1970 07-02-1972 10-04-1972 |